

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated February 17, 2004 (U.S. Patent Office Paper No. 11). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1, 3, 7, 9, 10, 12, 13, 24, and 25 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. Claims 8 and 20 are being canceled without prejudice or disclaimer. Claims 5, 11, 17, 23, and 26 were canceled in a previous communication with the Office. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formal Objections or Rejections

Claims 1, 13, and 24 were rejected due to several informalities. Applicants have amended claims 1, 13, and 24, and submit that all informalities pertaining to the recitation of the claims have been cured.

Prior Art Rejections

Claims 1 to 4, 6, 7, 9, 10, 12 to 16, 18, 19, 21, 22, 24 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Flynn, Jr., U.S. Patent No. 6,453,392, (further, Flynn '392) and Applicant's Admitted Prior Art (further, AAPA).

Claims 8 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Flynn, Jr., U.S. Patent No. 6,453,392, (further, Flynn '392) and Applicant's Admitted Prior Art, (further, AAPA) as applied to claims 7 and 19, and in further view of Firoozmand, U.S. Patent No. 5,488,724, (further, Firoozmand '724).

The present invention as recited in amended claim 1 is directed to a storage system that receives a command to which an ID number for identifying one of a plurality of OSs is

attached, derives said ID number, and returns a response that indicates whether to process or reject the access to a logical volume with said ID number attached thereto, depending on whether the one of the plurality of OSs identified by said command is authorized to access the logical volume. The storage system checks whether the one of the plurality of OSs is authorized or not access based on a table, which includes authentication information of each of the plurality of the OSs. The storage system receives the authentication information of the plurality of OSs from a computer connected to the storage system by using a control frame and sets the authentication information into the table in advance. The command sent to the storage system includes the ID number coded in a data frame from which said storage system derives the ID number.

Claims 2 to 4 and 6 add to the above the feature that the authentication information includes information that some of the plurality of OSs have authentication access to the logical volume, the authentication information includes priority information which indicates that a command issued from one of the plurality of OSs should be treated prior to the other command issued from the other one of the plurality of OSs, whether to process or reject the access requested by the command received is determined based on present authority and the response is returned, and the system returns the response which is determined depending on a combination of a plurality of types of ID numbers attached to the command received.

Among the main features of the present invention, a storage system has a table that includes authentication information. The authentication information includes information about whether each of a plurality of OSs that accesses the storage system has authentication to use the storage system or not. Further details about this feature of the invention can be found in Fig. 18. The authentication information is sent and stored in advance into the table pertaining to the storage system. The storage system decides if a command that is issued by one of the plurality of OSs should be accepted or not, based on the OS's ID that is included in the command and the authentication information stored in the table.

Another feature of the present invention as now recited in each of the claims as amended, the ID number of the one of the plurality of OSs from which the command originates is coded in a data frame with the command, and is derived from the data frame by the storage system.

With respect to Flynn '392, the Examiner asserted in the Office Action that col. 9, between lines 1 and 15, of Flynn '392 shows the storage system of claim 1. However, the Examiner conceded on pages 3 and 4 of the Office Action that Flynn '392 does not

specifically disclose, teach or suggest that the storage system checks whether the one of the plurality of OSs is authorized access or not based on a table which includes authentication information of each of the plurality of the OSs, that the storage system receives from a computer connected to the storage system by using a control frame and sets the authentication information into the table in advance. The Examiner further conceded on page 5 of the Office Action that Flynn '392 does not teach, disclose or suggest that the authentication information includes information that some of the plurality of OSs have authentication access to the logical volume. Even more, the Examiner conceded on the same page 6 that Flynn '392 does not specifically disclose, teach or suggest that the authentication information includes priority information which indicates that a command issued from one of the plurality of OSs should be treated prior to the other command issued from one of the other one of the plurality of OS's. Therefore, Flynn '392 by itself does not disclose, teach or suggest a storage system, as recited in claims 1 to 4 and 6.

The Examiner further asserted in the Office Action on page 4, in the second paragraph, that AAPA cures the deficiencies of Flynn '392 by disclosing a storage system that checks whether one of the plurality of OSs by said command is authorized or not based on a table which includes the authentication information of each of the plurality of the OSs, and that receives the authentication information about the plurality of OSs from a computer connected to the storage system by using a control frame and sets the authentication information into the table in advance. The Examiner asserted that it would have been obvious for a person skilled in the art to use the method disclosed by the AAPA to cure the deficiencies of Flynn '392.

The position of the Examiner as to the disclosure of AAPA curing the deficiencies of Flynn '392 is respectfully traversed. Applicants respectfully submit that AAPA merely discloses that a storage system checks whether one of the plurality of server computers can have access or not to a logical volume, based on the World Wide Name assigned to each of the plurality of server computers. The storage system disclosed by the AAPA does not distinguish a plurality of OSs, when the plurality of OSs are executed in one server computer. The storage system disclosed by AAPA distinguishes only among the plurality of server computers. Therefore, the disclosure of AAPA does not disclose, teach or suggest that the storage system checks whether one of the plurality of OSs is authorized or not access to a logical volume, as recited in claim 1.

In view of the foregoing, Applicants respectfully submit that the above described deficiencies of Flynn '392, conceded by the Examiner in the Office Action, along with the failure of AAPA to disclose, teach or suggest that "the one of the plurality of OSs by said command is authorized or not based on a table which includes authentication information of each of the plurality of the OSs", as recited in claim 1, illustrate that these applied references do not disclose, teach or suggest the storage system recited by claim 1. Therefore, claim 1 and claims 2 to 4 and 6 are not rendered obvious under 35 U.S.C. §103(a) by the combination of Flynn '392 and AAPA. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 1 and 2-4 and 6 is respectfully requested.

The present invention, as recited in claims 7 to 10 is directed to a virtual private control method. The invention as recited in claim 12 is directed to an OS management software. The invention as recited in claim 13 to 16 and 18 is directed to a storage system. The invention as recited in claims 19 to 22 is directed to a virtual private volume control method. The invention as recited in claim 24 is directed to an OS management software. The invention as recited in claim 25 is directed to a storage system. Among the main features of the present invention shared by all the above referenced claims is that whether one of the plurality of OSs is authorized or not is based on a table which includes authentication information of each of the plurality of the OSs, and the ID number of the one of the plurality of OSs from which the command originates is coded in a data frame with the command, and is derived from the data frame by the storage system.

Applicants submit, in response to the rejection of claims 7 to 10, 12, 13 to 16 18 to 22, 24, and 25 that it has been found and shown above that none of the references cited by the Examiner in support of the rejection to claims 1 to 4 and 6 discloses or suggests all the features of the present invention, either by themselves or in combination. Therefore, the present invention as recited in claims 7 to 10, 12, 13 to 16, 18 to 22, 24, and 25 is also not obvious in view of the combination of Flynn '392 and AAPA.

Claims 8 and 20 both recite that the server codes the application's and the OS's ID numbers into a data frame and sends the data frame as the command, and the disk apparatus receives the data frame and derives the ID numbers therefrom.

With respect to claims 8 and 20, the Examiner conceded in the Office Action, on page 15, that neither Flynn '392 nor AAPA disclose coding ID numbers in data frame and sending the data frame as a command, as recited in claims 8 and 20. With respect to Firoozmand '724

the Examiner asserted the reference cures the deficiencies of Flynn '392 and AAPA by disclosing in the Abstract and in col. 20, lines 8-13 that ID numbers are coded in data frame and sent as a command. The Examiner further asserted in the Office Action, on page 15 that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the systems of Flynn '392 and AAPA to include coding ID numbers in a data frame and sending the data frame as a command because it would have optimized storage of framed data.

The position of the Examiner as to the disclosure of Firoozmand '724 curing the deficiencies of Flynn '392 and AAPA is respectfully traversed. Applicants respectfully submit that Firoozmand '724, in the Abstract and col. 20, lines 8 to 13 cited by the Examiner does not disclose, teach or suggest that the application's and the OS's ID numbers are converted into a data frame and the data frame is sent as the command, and a disk apparatus receives the data frame and derives the ID numbers therefrom, as recites in claims 8 and 20. Firoozmand '724 merely discloses that in response to a data asserted when the medium access controller has stored received data from the network into the buffer memory, to be transferred by the network DMA controller to the system memory, the network DMA controller carries out a host request on the host request bus, with the proper code, to request to the network access controller to read data frames from the network. The network access controller arbitrates the bus of the buffer memory and provides an acknowledgement on a bus host acknowledge. Therefore, the disclosure of Firoozmand '724 does not disclose, teach or suggest that the OS's ID number is encoded into a data frame and the data frame is sent as the command.

In view of the foregoing, Applicants respectfully submit that the above described deficiencies of Flynn '392 and AAPA, conceded by the Examiner in the Office Action, along with the failure of Firoozmand '724 to disclose, teach or suggest that "server codes said OS's ID number into a data frame and sends the data frame as the command and said disk apparatus receives the data frame and derives said ID number therefrom" as recited in the independent claims illustrate that these applied references do not disclose, teach or suggest the present invention as now recited in all the claims. Therefore, withdrawal of the 35 U.S.C. §103(a) rejection based on the combination of Flynn '392, AAPA and Firoozmand '724 is respectfully requested.

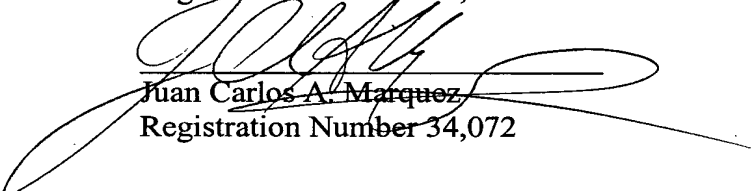
Conclusion

In view of all the above, Applicants respectfully submit that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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